

WHAT IS CLAIMED IS:

1. A method of fabricating a memory, comprising steps of:

5 forming a storage material film on a first electrode film;

 forming a storage part and an etched thin-film part by partially etching said storage material film by a prescribed thickness;

10 forming an insulator film to cover at least said thin-film part of said storage material film; and

 patterning said insulator film and said thin-film part of said storage material film by forming an etching mask on a prescribed region of said insulator film and
15 thereafter etching said insulator film and said thin-film part of said storage material film through said etching mask.

2. The method of fabricating a memory according to
20 claim 1, wherein

 said step of forming said storage part and said thin-film part includes a step of partially etching said storage material film so that said thin-film part has a thickness of at least about 15 % of the thickness of said
25 storage material film on the average.

3. The method of fabricating a memory according to claim 2, wherein

5 said step of forming said storage part and said thin-film part includes a step of partially etching said storage material film so that said thin-film part has a thickness of not more than about 95 % of the thickness of said storage material film on the average.

10 4. The method of fabricating a memory according to claim 2, wherein

said step of forming said storage part and said thin-film part includes a step of partially etching said storage material film with etching gas containing no
15 chlorine-based gas.

5. The method of fabricating a memory according to claim 1, said memory further comprising a memory cell array region formed with said storage material film, a
20 peripheral circuit region and a connecting wire for connecting said memory cell array region and said peripheral circuit region with each other, wherein

said step of patterning said insulator film and said thin-film part of said storage material film includes a
25 step of patterning said insulator film and said thin-film

part of said storage material film so that no said thin-film part of said storage material film is present at least in the vicinity of a region connecting said memory cell array region and said connecting wire with each other.

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6. The method of fabricating a memory according to claim 5, further comprising steps of:

forming an interlayer dielectric film covering at least a portion close to said region connecting said memory cell array region and said connecting wire with each other after patterning said insulator film and said thin-film part of said storage material film, and

forming an opening for connecting said memory cell array region and said connecting wire with each other by etching a prescribed region of said interlayer dielectric film.

7. The method of fabricating a memory according to claim 6, further comprising a step of connecting said first electrode film of said memory cell array region and said connecting wire with each other through said opening.

8. The method of fabricating a memory according to claim 1, wherein

said step of forming said insulator film includes a

step of forming said insulator film having a function of inhibiting hydrogen from diffusion.

9. The method of fabricating a memory according to
5 claim 1, wherein

said first electrode film includes a first lower electrode film and a second lower electrode film formed on said first lower electrode film.

10 10. The method of fabricating a memory according to claim 9, wherein

said first lower electrode film has a function of inhibiting oxygen from diffusion.

15 11. The method of fabricating a memory according to claim 1, wherein

said storage material film is either a ferroelectric film or a colossal magnetoresistance film.

20 12. A memory comprising:

a first electrode film;

a storage material film, formed on said first electrode film, provided with a storage part and a thin-film part having a thickness, smaller than the thickness
25 of said storage part, of at least about 15 % of the

thickness of said storage part on the average;

a second electrode film formed on said storage part of said storage material film.

5 13. The memory according to claim 12, wherein
said thin-film part has a thickness of not more than
about 95 % of the thickness of said storage material film
on the average.

10 14. The memory according to claim 12, further
comprising an insulator film formed to cover said second
electrode film and said thin-film part of said storage
material film against an etching mask employed for working
said thin-film part of said storage material film.

15 15. The memory according to claim 14, wherein
said insulator film includes a film having a function
of inhibiting hydrogen from diffusion.

20 16. The memory according to claim 12, further
comprising:

a memory cell array region formed with said storage
material film,

a peripheral circuit region, and

25 a connecting wire for connecting said memory cell

array region and said peripheral circuit region with each other, wherein

said storage material film is so patterned that no said thin-film part of said storage material film is present at least in the vicinity of a region connecting said memory cell array region and said connecting wire with each other.

17. The memory according to claim 16, further comprising an interlayer dielectric film covering at least a portion close to said region connecting said memory cell array region and said connecting wire with each other and having an opening, wherein

said first electrode film of said memory cell array region and said connecting wire are connected with each other through said opening.

18. The memory according to claim 12, wherein said first electrode film includes a first lower electrode film and a second lower electrode film formed on said first lower electrode film.

19. The memory according to claim 18, wherein said first lower electrode film has a function of inhibiting oxygen from diffusion.

20. The memory according to claim 12, wherein
said storage material film is either a ferroelectric
film or a colossal magnetoresistance film.

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21. The memory according to claim 12, wherein
said storage material film is formed to cover the
upper surface and the side surfaces of said first
electrode film.

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22. The memory according to claim 12, further
comprising:

a transistor having a pair of source/drain regions,
and

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a metal plug connected to one of said source/drain
regions of said transistor, wherein

said first electrode film is formed to come into
contact with said metal plug.